

WHAT IS CLAIMED IS:

1. A composite product comprising a substrate layer and one or more functional layers applied thereto, each functional layer including a mixture of hydraulic binder, dewatering agent wherein the quantity of dewatering agent is sufficient to permit de-watering of each functional layer through the substrate layer and any additional functional layer.
2. A composite product according to claim 1, wherein each functional layer includes one or more functional additives to provide desired properties to that layer.
3. A composite product according to claim 1, wherein the substrate layer is a fibre reinforced base material.
4. A composite product according to claim 1, wherein the substrate layer is a reinforced cementitious product.
5. A composite product according to claim 1, wherein the functional layers are added to both sides of the substrate layer.
6. A composite product according to claim 1, wherein the functional layers are added to one side of the substrate layer.
7. A composite product according to claim 1, wherein each functional layer is covered by a reinforcing layer.
8. A composite product according to claim 7, wherein the reinforcing layer comprises fibre mesh or netting.
9. A composite product according to claim 7, wherein the reinforcing layer is a fibre reinforced cementitious layer.
10. A composite product according to claim 1, wherein the composite product comprises outer layers provided by fibre reinforced cementitious layers with one or more functional layers positioned therebetween.
11. A composite product according to claim 10, wherein the functional layers have a low fibre content relative to the fibre reinforced cementitious layers.
12. A composite product according to claim 1, wherein additives and/or fillers are incorporated in the functional layers to provide the desired acoustic properties, thermal or fire performance, density modification, cost or production efficiency, compressive or tensile strength, water permeability, density or aesthetic properties to the composite product.

13. A composite product according to claim 1, wherein the dewatering agent is provided in a sufficient quantity to maintain porosity in the functional layer(s) and the substrate layer during dewatering.

14. A composite product according to claim 1, wherein the dewatering agent is a particulate material.

15. A composite product according to claim 1, wherein the dewatering agent is selected from the group consisting of fly ash, alumina trihydrate, silica flour, cenospheres and mixtures thereof.

16. A composite product according to claim 1, wherein the product is cured by air curing, steam curing or hydrothermally cured in an autoclave.

17. A composite product according to claim 1, wherein the product is a cementitious building board or product or gypsum building board.

18. A composite product according to claim 1, wherein the thickness of the functional layer on the product is between about 0.1 and 10 mm.

19. A composite product according to claim 1, wherein the hydraulic binder used in the functional layer is selected from the group consisting of white, grey or pigmented cements, hydraulic limes and mixtures thereof.

20. A composite product according to claim 1, wherein the binder in the functional layer is between about 10 and 50 wt% based on total dry ingredients.

21. A composite product according to claim 1, wherein fly ash is the dewatering agent.

22. A composite product according to claim 1, wherein the dewatering agent comprises:

i) about 10 to 60% of the formulation based on total dry ingredients of a first fly ash component having a particle diameter between about 1 and 100 microns; and

ii) about 5 to 30 wt% of the formulation based on total dry ingredients of a second fly ash component having a maximum particle size diameter of around 10 microns.

23. A composite product according to claim 1, wherein the dewatering agent includes a coarse fraction fly ash having a particle size diameter greater than about 100 microns.

24. A composite product according to claim 1, wherein the functional layer includes additives to improve the properties of the substrate layer such that upon dewatering of the functional layer, the substrate layer is thus treated with said additive.